UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte THOMAS HERMAN

Appeal No. 2005-0328
Application No. 09/723,655

ON BRIEF

Before HAIRSTON, RUGGIERO and NAPPI, Administrative **Patent Judges.**

NAPPI, **Administrative Patent Judge.**

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 of the final rejection of claims 9 through 14, 21 and 22

Invention

The invention relates to a method of making a MOS gated device. The method makes use of polysilicon stripes to define a mask for the formation of three sequential regions, the first being a base diffusion, the second being a source diffusion and the third being a higher concentration base region which underlies the first base and does not invade the invertible channel formed by the first base and source. See page 4 of appellant's specification.

Claim 9 is representative of the invention.

9. A process of manufacture of a MOSgated device comprising:

forming a gate oxide layer atop a silicon surface of one conductivity type;

forming a layer of polysilicon atop said gate oxide layer; etching said polysilicon layer and said underlying gate oxide layer into a plurality of stripes of oxide and polysilicon spaced 1 to 4 microns and overlying said silicon surface; implanting and diffusing a plurality of spaced first base diffusion stripes of the other conductivity type into said silicon surface, using said stripes of oxide and polysilicon as a mask; implanting and diffusing a plurality of source diffusions into said first base diffusion stripes, using said stripes of oxide and polysilicon as a mask, and leaving invertible channel regions along the outer edges of said first base diffusion stripes; implanting and diffusing second base diffusion stripes into said silicon surface using said stripes of oxide and polysilicon as a mask, to a depth below that of said source diffusions and extending to between the opposite edges of adjacent pairs of said polysilicon stripes; wherein said stripes of oxide and polysilicon do not include sidewall spacers during implanting and diffusing of said first base diffusion stripes, said source diffusions, and said second base diffusions.

References

The references relied upon by the examiner are as follows:

Davies	5,155,052	Oct. 13, 1992
Ajit et al. (Ajit)	5,474,946	Dec. 12, 1995

Rejection at Issue

Claims 9 through 14, 21 and 22 are rejected under 35 U.S.C. § 103 as being unpatentable over Davies and Ajit as set forth on pages 5 through 7 of the answer. Throughout the opinion we make reference to the briefs and the answer for the respective details thereof.

Opinion

We have carefully considered the subject matter on appeal, the rejection advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellant's arguments set forth in the briefs along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

With full consideration being given to the subject matter on appeal, the examiner's rejection and the arguments of appellant and examiner, for the reasons stated ***infra*** we reverse the examiner's rejection of claims 9 through 14, 21 and 22 under 35 U.S.C. § 103.

Appellant argues on pages 4 and 5 of the brief:

> Davies does not teach using the oxide and polysilicon stripes in forming the second base diffusions. Indeed, Davies teaches the opposite.
>
> Davies teaches forming sidewall spacers 18 before forming low resistivity regions 17. That is, sidewall spacers 18 are used for positioning low resistivity regions. Col. 4, lines 12-14. As a result, contrary to the results achieved by the present invention, the low resistively regions 17 do not extend laterally as far as possible.

Further, on pages 5 and 6 of the brief, appellant argues, citing Davies column 4, lines 25-43, that the sidewall spacers are critical to Davies device and as such Davis teaches away from the claimed feature of using the oxide and polysilicon stripes which do not have sidewall spacers as a mask for forming the second base diffusions.

In response, the examiner states, on pages 7 and 8 of the answer:

> With regard to the appellant's arguments that "Davies teaches forming sidewall spacers 18 before forming low resistivity regions 17," it should be noted that Davies, in column 4, lines 38-43, specifically recites the situation where sidewall spacers are not used in implanting the low resistivity regions 17 which correspond to the claimed second base diffusion. Thus Davies teaches in figures 1-4 and column 4, lines 38-43 the limitation wherein the stripes of oxide and polysilicon do not include sidewall spacers during implanting and diffusion of the second base diffusion. Therefore, the arguments are not persuasive, and the rejection is proper.
>
> With regard to the appellant's argument that "Davies actually teaches away from using the oxide and polysilicon stripes as a mask in forming the second base regions (low resistivity regions 17)," it should be noted Davies never states that the claimed situation cannot produce a working device. While Davies suggests in column 4, lines 25-43 "it has been found that if a thin oxide, analogous to oxide 15 [which is a misprint and should be 'oxide 16'] shown in Fig.1, is used rather than a sidewall spacer 18, insufficient separation between base 12 and low resistively region 17 is provided, and correspondingly low yield result," (emphasis added [by examiner]) it is clear that insufficient separation does not make the device inoperable. Low yields, whether good or bad, do not make Davies teach away from the subject matter. On the contrary, the low yields cited by Davies when sidewall spacers are not used prove that this method is disclosed and does produce a working device. Therefore, appellant's arguments are not persuasive, and the rejection is proper.

We disagree with the examiner's rationale. Claim 9 includes the limitation "wherein said stripes of oxide and polysilicon do not include sidewall spacers during implanting and diffusing of said first base diffusion stripes, said source diffusions, and said second base diffusions." We concur with the appellant that Davies teaches away from this limitation.

Our reviewing court has said "[A] reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be lead in a direction divergent from the path that was taken by the applicant. The degree of teaching away will of course depend on the particular facts; in general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant." ***In re Gurley***, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994) (*citing* ***United States V. Adams***, 383 U.S. 39, 52, 148 USPQ 479, 484 (1966)("known disadvantages in old devices which would naturally discourage the search for new inventions may be taken into account in determining obviousness"). However, a reference that "teaches away" does not ***per se*** preclude a ***prima facie*** case of obviousness, but rather the "teaching away" of the reference is a factor to be considered in determining unobviousness. *Id* 27 F.3d at 552, 31 USPQ 2d at 1132. A reference that neither teaches a limitation nor warns against using the limitation does not require a finding that the reference "teaches away" rather the teaching of the reference must be considered alongside the teachings of the secondary reference. ***ParaOrdnance Manufacturing Inc. V. SGS Importers Int. Inc.***, 73 F.3d 1085, 1090, 37 USPQ2d 1237, 1241 (Fed. Cir. 1995).

Davies states "Width of the sidewall spacer 18 is a critical feature of the present invention" (column 4, lines 25-26) "[i]f this spacing is too small, or varies widely due to the process control of forming the spacer 18, low resistivity region 17 will extend into channel 26, destroying the device. For example, it has been found that if a thin oxide, analogous to oxide 15 [sic, 16] shown in Fig. 1, is used rather than a sidewall spacer 18, insufficient separation between base 12 and low resistivity region 17 is provided, and correspondingly low yields result" (column 4, lines 35-43). We find that one of ordinary skill in the art reading these sections of Davies would be discouraged from pursuing the path of manufacturing the device without the use of sidewall spacers. The examiner has presented no other evidence to show that one of ordinary skill in the art would be motivated to not include sidewall spacers during implanting and diffusing of said base diffusion stripes, said source diffusions and said second base diffusions. Accordingly, we find that the examiner has not established a ***prima facie*** of obviousness and we will not sustain the examiner's rejection of independent claim 9 or dependent claims 10 through 14, 21 and 22.

In view of the forgoing, we will not sustain the examiner's rejection of claims 9 through 14, 21 and 22 under 35 USC § 103.

REVERSED

KENNETH W. HAIRSTON)
Administrative Patent Judge)
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JOSEPH F. RUGGIERO) BOARD OF PATENT
Administrative Patent Judge) APPEALS AND
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